

Docket No.: 242926US0

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF:  
Shigeru KURAMOTO, et al.

GROUP: 1742

SERIAL NO: 10/663,786

EXAMINER: ROE, J. R.

FILED: September 17, 2003

FOR: TITANIUM ALLOY AND PROCESS FOR PRODUCING THE SAME

**DECLARATION UNDER 37 C.F.R. § 1.132**

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

Sir:

Now comes Shigeru Kuramoto who deposes and states that:

1. I am a graduate of The University of Tokyo and received my Doctor of Engineering degree in the year 1994.
2. I have been employed by Toyota Central R & D Laboratories, Inc. for 6 years as a researcher in the field of Materials Science.
3. The following experiments were carried out by me or under my direct supervision and control.
4. Specimens 1-6 according to the invention were prepared and compared with specimens C2-C4 which do not conform to the oxygen content and  $M_{eq}$  limitations in claim 1. Parameters within the limitations of claim 1 have been **embolded** and presented in 12 pt numerals in the following table.

Application No. 10/633,786  
Declaration under 37 C.F.R. §1.132

Test Piece No.	Composition (mass%)			Mechanical Characteristic				Structure after Solution Treatment	Occurrence of Stress-Induced Transformation
	Alloying Element (mass%)	Oxygen (mass%)	Mo <sub>eq</sub>	Young's Modulus (GPa)	Tensile Strength (MPa)	Tensile Elastic Limit Strength (MPa)	Elastic Deformability (%)		
1	Ti-8%V-1%Fe	<b>0.6</b>	<b>8.26</b>	<b>60</b>	<b>1392</b>	1203	<b>2.0</b>	<b>β Single Phase</b>	None
2	Ti-10%Mo-6%Zr-4.5%Sn	<b>0.6</b>	<b>10</b>	<b>63</b>	<b>1315</b>	998	<b>1.9</b>	<b>β Single Phase</b>	None
3	Ti-25%Nb-2%Ta	<b>1.5</b>	<b>7.44</b>	<b>65</b>	<b>1820</b>	1569	<b>2.2</b>	<b>β Single Phase</b>	None
4	Ti-32%Nb-2%Ta-3%Zr	<b>0.8</b>	<b>9.4</b>	<b>50</b>	<b>1593</b>	1324	<b>2.8</b>	<b>β Single Phase</b>	None
5	Ti-15%Nb	<b>0.6</b>	<b>4.2</b>	<b>65</b>	<b>1324</b>	1160	<b>1.9</b>	<b>β Single Phase</b>	None
6	Ti-36%Nb-2%Ta	<b>1.5</b>	<b>10.52</b>	<b>67</b>	<b>1617</b>	1302	<b>2.7</b>	<b>β Single Phase</b>	None
C1	Ti-40%Nb-10%Ta-5%Zr	0.3	<b>13.4</b>	80	981	789	1.0	<b>β Single Phase</b>	None
C2	Ti-4%Mo-3%Al	<b>0.6</b>	1	100	<b>1410</b>	1121	1.1	<b>α Phase + β Phase</b>	None
C3	Ti-32%Nb-2%Ta	0.2	<b>9.4</b>	<b>50</b>	904	487	1.0	<b>α' Phase + β Phase</b>	Occurred
C4	Ti-40%Nb-2%Ta	<b>1.5</b>	11.64	80	<b>1710</b>	1568	1.2	<b>β Single Phase</b>	None

6. As apparent from the above comparisons, titanium alloys conforming to the parameters required by claim 1 have superior physical properties as well as exhibiting a  $\beta$  single phase. Comparative alloys, C1 and C4 also exhibit a  $\beta$  single phase, however, they do not have other compositional and physical properties required by claim 1.

7. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

8. Further deponent saith not.

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(OSMMN 05/06)

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Signature

Shigetaka Kuramoto

Date

Feb. 25, 2008